

On March 21, 1995, following payments by the Governments of Canada (\$1,780,749.14), the European Community (\$399,695.21), Kuwait (\$2,500,000.00), Norway (\$261,758.10), and Switzerland (\$40,000.00), respectively, to the special United Nations-controlled account, entitled "United Nations Security Council Resolution 778 Escrow Account," the Federal Reserve Bank of New York was directed to transfer a corresponding amount of \$4,982,202.45 from the blocked account it holds to the United Nations-controlled account. Similarly, on April 5, 1995, following the payment of \$5,846,238.99 by the European Community, the Federal Reserve Bank of New York was directed to transfer a corresponding amount of \$5,846,238.99 to the United Nations-controlled account. Again, on May 23, 1995, following the payment of \$3,337,941.75 by the European Community, \$571,428.00 by the Government of the Netherlands and \$1,200,519.05 by the Government of the United Kingdom, the Federal Reserve Bank of New York was directed to transfer a corresponding amount of \$5,109,888.80 to the United Nations-controlled account. Finally, on June 19, 1995, following the payment of \$915,584.96 by the European Community and \$736,923.12 by the Government of the United Kingdom, the Federal Reserve Bank of New York was directed to transfer a corresponding amount of \$1,652,508.08 to the United Nations-controlled account. Cumulative transfers from the blocked Federal Reserve Bank of New York account since issuance of Executive Order No. 12817 have amounted to \$175,133,026.20 of the up to \$200 million that the United States is obligated to match from blocked Iraqi oil payments, pursuant to United Nations Security Council Resolution 778.

5. The Office of Foreign Assets Control has issued a total of 590 specific licenses regarding transactions pertaining to Iraq or Iraqi assets since August 1990. Licenses have been issued for transactions such as the filing of legal actions against Iraqi governmental entities, legal representation of Iraq, and the exportation to Iraq of donated medicine, medical supplies, food intended for humanitarian relief purposes, the execution of powers of attorney relating to the administration of personal assets and decedents' estates in Iraq, the protection of preexistent intellectual property rights in Iraq and travel to Iraq for the purposes of visiting Americans detained there. Since my last report, 57 specific licenses have been issued.

6. The expenses incurred by the Federal Government in the 6 month period from February 2, 1995, through August 1, 1995, which are directly attributable to the exercise of powers and authorities conferred by the declaration of a national emergency with respect to Iraq are reported to be about \$4.9 million, most of which represents wage and salary costs for Federal personnel. Personnel costs were largely centered in the Department of the Treasury

(particularly in the Office of Foreign Assets Control, the U.S. Customs Service, the Office of the Under Secretary for Enforcement, and the Office of the General Counsel), the Department of State (particularly the Bureau of Economic and Business Affairs, the Bureau of Near Eastern Affairs, the Bureau of International Organization Affairs, the Bureau of Political-Military Affairs, the U.S. Mission to the United Nations, and the Office of the Legal Adviser) and the Department of Transportation (particularly the U.S. Coast Guard).

7. The United States imposed economic sanctions on Iraq in response to Iraq's illegal invasion and occupation of Kuwait, a clear act of brutal aggression. The United States, together with the international community, is maintaining economic sanctions against Iraq because the Iraqi regime has failed to comply fully with United Nations Security Council resolutions. Security Council resolutions on Iraq call for the elimination of Iraqi weapons of mass destruction, Iraqi recognition of Kuwait and the inviolability of the Iraq-Kuwait boundary, the release of Kuwaiti and other third-country nationals, compensation for victims of Iraqi aggression, long-term monitoring of weapons of mass destruction capabilities, the return of Kuwaiti assets stolen during Iraq's illegal occupation of Kuwait, renunciation of terrorism, an end to internal Iraqi repression of its own civilian population, and the facilitation of access of international relief organizations to all those in need in all parts of Iraq. More than 5 years after the invasion, a pattern of defiance persists: a refusal to account for missing Kuwaiti detainees; failure to return Kuwaiti property worth millions of dollars, including military equipment that was used by Iraq in its movement of troops to the Kuwaiti border in October 1994; sponsorship of assassinations in Lebanon and in northern Iraq; incomplete declarations to weapons inspectors; and ongoing widespread human rights violations. As a result, the U.N. sanctions remain in place; the United States will continue to enforce those sanctions under domestic authority.

The Baghdad government continues to violate basic human rights of its own citizens through systematic repression of minorities and denial of humanitarian assistance. The Government of Iraq has repeatedly said it will not be bound by United Nations Security Council Resolution 688. For more than 4 years, Baghdad has maintained a blockade of food, medicine, and other humanitarian supplies against northern Iraq. The Iraqi military routinely harasses residents of the north and has attempted to "Arabize" the Kurdish, Turcomen, and Assyrian areas in the north. Iraq has not relented in its artillery attacks against civilian population centers in the south or in its burning and draining operations in the southern marshes, which have forced thousands to flee to neighboring

States. In April 1995, the U.N. Security Council adopted resolution 986 authorizing Iraq to export limited quantities of oil (up to \$1 billion per quarter) under U.N. supervision in order to finance the purchase of food, medicine, and other humanitarian supplies. The resolution includes arrangements to ensure equitable distribution of such assistance to all the people of Iraq. The resolution also provides for the payment of compensation to victims of Iraqi aggression and for the funding of other U.N. activities with respect to Iraq. Resolution 986 was carefully crafted to address the issues raised by Iraq to justify its refusal to implement similar humanitarian resolutions adopted in 1991 (Resolutions 706 and 712), such as oil export routes and questions of national sovereignty. Nevertheless, Iraq refused to implement this humanitarian measure. This only reinforces our view that Saddam Hussein is unconcerned about the hardships suffered by the Iraqi people.

The policies and actions of the Saddam Hussein regime continue to pose an unusual and extraordinary threat to the national security and foreign policy of the United States as well as to regional peace and security. The U.N. resolutions require that the Security Council be assured of Iraq's peaceful intentions in judging its compliance with sanctions. Because of Iraq's failure to comply fully with these resolutions, the United States will continue to apply economic sanctions to deter it from threatening peace and stability in the region.

WILLIAM J. CLINTON.

THE WHITE HOUSE, August 1, 1995.

SPECIAL ORDERS

The SPEAKER pro tempore. Under the Speaker's announced policy of May 12, 1995, and under a previous order of the House, the following Members will be recognized for 5 minutes each.

TOBACCO AND AMERICA'S YOUTH

[Additional statements to Mr. WAXMAN's testimony in the RECORD of Monday, July 31, 1995.]

DECEMBER 31, 1970.

Dr. P. A. EICHORN.

W. L. DUNN, Jr.

Quarterly Report of Projects 1600 and 2302—October 1-December 31, 1970.

WORK COMPLETED

Filter configuration preference

Some 500 smokers were interviewed in the streets and places of business of Richmond, Virginia. They were asked to rank order as to preference five filter ends all of which differed in appearance. One of the five was clearly the consistently preferred design.

Methods study

Report written. Findings: (1) The position effect is of such great magnitude as to possibly mask any real discerned differences between two cigarettes. (2) Differences in preference values between POL and SEF panelists were articulated. (3) A possible deficiency in the Marlboro smoke was isolated.

SERVICE VOLUME

	Number of tests	Number of judgments
Descriptive panel	32	385
Other panels	150	8,614
Field tests completed	8	3,350
Field tests in progress	13	7,850

WORK IN PROGRESS

Determinants of Menthol Cigarette Preference

Data in process.

Smoking and Heart Rate

Report being typed.

Anxiety and Cigarette Smoking

Data collection completed. Analysis in process.

Bird-I

Computer problems have plagued the completion of this study. There yet remain several computer runs before the final report can be assembled.

Project Carib

Seventeen of 21 invitees have agreed to participate, one has declined and three have yet to reply.

Nicotine/tar Ratio Study

We are initiating a study of the effect of systematic variation of the nicotine/tar ratios upon smoking rate and acceptability measures. Using the Marlboro as a base cigarette, we will reduce the tar delivery incrementally by filtration and increase the nicotine delivery incrementally by adding a nicotine salt. All cigarettes will be smoked for several days by each of a panel of 150 selected volunteers.

Smoking and Low Delivery Cigarettes

A study similar to the foregoing, but using a national mailout panel and a wider range (5–20 mg) of tar delivery.

Nicotine Discrimination Study

Marlboro type cigarettes with increments of nicotine salt added were smoked on a handout basis by R&D volunteers. Tentative results suggest that differences in nicotine levels can be discriminated and then do influence acceptability judgments. Report in progress.

PHILIP MORRIS,

Richmond, VA, September 8, 1971.

INTER-OFFICE CORRESPONDENCE

To: Dr. P. A. Eichorn.

From: W. Dunn M. Johnston, F. Ryan, and T. Schori.

Subject: Plans for 1972.

1. We will concentrate upon the nicotine/tar ratio as a factor in determining cigarettes acceptability. We have established that tar nicotine levels ranged upwards from current production the current production level of nicotine is preferred. However the nicotine/tar ratio was not an independent variable since the base tar delivery of 16 mg increased absolutely with the increase of nicotine. Subsequently we established that among combinations of three levels of nicotine (1.2, 1.9, 2.2) and three levels of tar (10, 16, 19) the low nicotine/high tar combination was preferred. Note that the lowest nicotine level tested was the current production level for flavorful filters. In a third study which gave smokers the option of very low nicotine (0.3 mg) and production level nicotine (1.2 mg) with a constant high tar delivery (24 mg), the preference was a function of smoker variables, notably sex and brand smoked.

Our plans now are to concentrate upon that nicotine delivery range between 0.3 and 1.2 mg with a systematic manipulation of the nicotine/tar ratio at incremental nicotine levels within this range. The nicotine/tar ratio of .07, which is characteristic of a broad range of natural leaf, shall be taken as the

mid-point of the ratio range. Obviously we must segment our smoking population for establishing optimum ratio levels.

Cigarettes with the following parameters will be smoked to determine optimal nicotine/tar regulations for cigarette acceptability of relatively low delivery cigarettes. [Chart omitted.]

Also, using the low nicotine tobacco (.3 mg nicotine) and air dilution or filtration techniques, the following low nicotine cigarettes will be evaluated in terms of their acceptability, first in local then, where indicated, national testing:

1. 18, 12, 5 mg tar vs. Marlboro
2. 18, 12, 5 mg tar vs. Kent
3. 18, 12, 5 mg tar vs. Cigarette gold
2. We plan to investigate the relationship between socio-economic status and smoking behavior in terms of whether or not the pan-elist smokes, type and brand smoked, quantity smoked, and changes over time in brand and quantity smoked.

We will: investigate relations between Status Inconsistency and Personality Characteristics; and look for SES relations in differences between smokers and nonsmokers which have been attributed to smoking.

3. Continuing an ongoing program in economic analyses, we plan to:

- a. Keep management apprised of the trends of tar and nicotine deliveries of cigarettes on the market by continuing to provide a regulate quarterly report and analysis of weighted average tar and nicotine deliveries.
- b. Provide economic forecast and information as guidance to the corporation by continuing the annual contribution to the Philip Morris U.S.A. Five-Year Plan.
- c. Provide economic information, principally for R&D and New York Marketing and Financial management, on selected economic aspects of cigarettes and their sales, through the study of such topics as:

1. the elasticity of demand for cigarettes
2. the impact of a value-added tax
3. switching patterns
4. brand image

4. We plan to complete our study of difference thresholds for RTO and menthol. In these studies we are looking for the just-noticeable differences which smokers can detect in these parameters.

5. We plan to study the relationship between Sustained Performance and Smoking:

1. On-the-job situation—Actual or simulated job situations will be used to study the effect of smoking on worker productivity.
- b. Driver Fatigue—The effect of smoking on driving performance will be evaluated in an actual 8–10 hour driving task.

6. We plan to systematically observe puffing patterns across different cigarettes using portable recorders being developed by Engineering in order to:

- a. Find standard puff profiles of a restricted group of smokers while working at their desks, smoking preferred cigarettes.
- b. Find how standard puff profiles of this group are changed when cigarette characteristics are changed (e.g. switch Multifilter smokers to Marlboros, Marlboro smokers to Multifilters).

7. We plan to hold the conference on Motivational Mechanisms in Cigarette Smoking in January, 1972, and publish the proceedings as expeditiously as possible. Two papers from Philip Morris R&D will be included.

8. Major strides have been made in maximizing computer usage in conducting our national field test program in terms of roster maintenance, panel selection, data processing and reporting. During the forthcoming year we shall concentrate on rebuilding the roster by eliminating inactive and recruiting new members. The program whose objective is to determine the relationship between emotional state and smoking will be aggressively pursued during the forthcoming year.

We intend to:

1. Further investigate relation between personality test scores and predicted puff rates among college students, e.g. anxiety and puff rate;

2. Expand shock-anxiety program to include other noxious stimuli, e.g. loud noises.

3. Expand dependent variables measured to include puff volume.

9. As a follow-up upon the demonstration of the preference justification effect as a contaminating variable in our current field test procedures, we plan to actively explore other field tests formats which would minimize the preference justification effect. Two such candidates have already been developed and will be tested within the next quarter.

10. If the trend of the past 15 years continues, it will be necessary to progressively reduce the tar delivery of our marketed brands in the future. Anticipating this need, we plan to address ourselves to the problem of determining the optimum way, among the multiple possible ways, of reducing the tar delivery of a cigarette.

Charge number: 1600.

Program title: Consumer Psychology.

Period covered: December 16–January 15, 1972.

Project title: Psychology of Smoking.

Project leader: W.L. Dunn, Jr.

The Conference on Motivation in Cigarette Smoking was held January 12–16 St. Martin. Work has now begun on publishing the proceedings of the conference.

Project title: Perceived Cigarette Attributes.

Project leader: T.R. Schori.

This is a national mailout study designed to determine the major cigarette characteristics as perceived by the smoker. Ballots will go out shortly.

Project title: A Comparison of the Effects of Caffeine and Cigarette Smoking.

Project leader: T.R. Schori.

This study was designed to compare the relative effects of caffeine and cigarette smoking on several indices of arousal in smokers. Smokers were tested under each of three conditions: smoking, caffeine, and placebo. Automated data acquisition was employed. Data analysis will commence shortly.

Project title: Smoking and Low Delivery Cigarettes.

Project leader: T.R. Schori.

Our specially grown low nicotine-high tar tobacco has arrived.

Low delivery cigarettes with varying tar and nicotine deliveries are being made with both the low nicotine tobacco and with ordinary tobacco. These cigarettes will be used in national mailouts to determine what combinations of tar and nicotine make for optimal acceptability in a low delivery cigarette.

Project title: Smoking and Low Delivery Cigarettes.

Project leader: T.R. Schori.

Several attempts have been made to produce cigarettes for a national mailout. Some difficulties have been encountered in achieving desired tar and nicotine levels.

Project title: TPM Difference Limens.

Project leader: T.R. Schori.

In this study we are attempting to determine what constitutes a just noticeable difference in cigarette TPM. Cigarettes at five different delivery levels will be sent to panelists in the field. Previously, rather unsuccessfully, we had taken a laboratory approach to this same problem.

Project title: Personality Revisited.

Project leader: T.R. Schori.

Our Tar, Nicotine, and Smoking Behavior Study disclosed some interesting relationships between various indices of smoking and

personality. We therefore tested students at two colleges to see whether our findings might be more general. Those data are commencing to come in.

OCTOBER 5, 1972.

Dr. P.A. EICHORN.

W.L. DUNN, Jr.

Quarterly Report—Projects 1600 and 2302.

SEX-III

Twelve hundred of the original 2400 filter smokers who participated in the SEX-I study in 1968 are, at the time of this writing, saying butts for R&D analysis. We will be attempting to relate change in smoke intake to other variables, notably change in available TPM, in the cigarette smoked.

Publication of smoking behavior: Motives and Incentives

Because of editing difficulties with one author, the volume is now likely to be delayed until January, 1973.

Participation in Food Motors Keep-Well Campaign

The Medical Department of Ford Motor Co. will be launching an exploratory study of a Prophylactic Program to Reduce Cardiovascular Illness among Employees. We will collaborate in the design and data collection. The study is in the early planning stage.

Miller Brewing

We are providing ongoing consultation and testing services to this subsidiary in the evaluation of its beer products.

The Schachter Studies

We are collaborating closely with this investigator and providing technical support to the research activities in the Psychology Dept. of Columbia University. A significant theoretical contribution to the understanding of cigarette smoking is believed imminent from this effort.

Puffing Behavior

We have begun gathering puffing data among student college smoking various brands of cigarettes and little cigars. Intake variables (puff frequency, interpuffing intervals, puff volume, etc.) should prove related to product preferences, FTC tar and nicotine delivery, etc. The human smoking recorder is used to monitor the puffing while subjects watch slides.

Personality and Puffing

We continue to observe differences in puffing behavior related to personality variables. The effect seems clearer among male subjects than among females.

Shock and Smoking

Data collection will resume in October at a new location (POL). We need to develop a different stressor as fear of shock is scaring away some of our more valuable subjects.

Sustained performance and smoking

In this two-part study, we are evaluating psychomotor performance of smokers, deprived smokers, and nonsmokers over time (3 hours). Part 1, concerned with complex task performance, has been completed. The subject's task consisted of five subtasks which had to be performed simultaneously. These subtasks were: a meter monitoring subtask (6 meters), a light monitoring subtask (4 lights), a visual choice reaction time subtasks, an auditory choice reaction time subtask, and a mental arithmetic subtask.

In terms of all five subtasks, the subjects showed significant improvements in performance over time. No significant differences in performance were found between the three smoking conditions except in the auditory subtask where smokers displayed the best performance. This latter finding suggests the possibility that smoking enhances auditory sensitivity and we are cur-

rently looking into this possibility. As we had found in previous studies, smokers had fewer significant mood changes (as measured by the Nowlis Mood Scale—a paper and pencil device to measure transient mood states) than did nonsmokers or deprived smokers. This suggests that smokers are more emotionally stable in this sort of test situation than are nonsmokers or deprived smokers.

Multiple Discriminant Analysis: A Repeated Measures Design, Virginia Journal of Science, 23, 62-63, Summer, 1972. Schori, T.R., and Tindall, J.E.

Menthol Cigarette Studies

Two menthol cigarette studies are underway. The first is designed to delineate the images possessed by various of the menthol cigarettes currently on the market. This is a questionnaire type study using national roster panelists.

The second type is a smoking test. It is designed to identify nicotine and menthol parameters which make for optimal acceptability of menthol cigarettes. This study has a three-stage design. The first stage is designed to identify those nicotine delivery levels which we might reasonably wish to consider for menthol cigarettes. Having identified these nicotine delivery levels, in stage 2 we will determine combinations of nicotine and menthol which make for optimal acceptability. And then in stage 3, cigarettes with these combinations will be tested against current brands of known quality and sales potential.

Bay Area Study

Marketing, for the past few months, has been trying to improve the image of Multifilter in the San Francisco Bay Area and San Jose. In this study, we are trying to determine whether this attempt to improve Multifilter's image has been successful. We are doing this by means of a mailout to smokers in these areas.

Tar and Nicotine Studies

We have done a number of nicotine to tar ratio studies. Development is continuing to try to make cigarette models with various levels of tar and nicotine using our low nicotine tobacco. When we get successful models, we will go out to a national panel in an attempt to determine combinations of tar and nicotine which make for optimal acceptability.

In addition, a local panel of smokers will test these cigarettes for nine weeks in order to determine the effect of tar and nicotine on cigarette consumption when both tar and nicotine deviate downward from that to which the smokers are accustomed. This is a follow-up of TNT-1.

PHILIP MORRIS,

Richmond, VA, November 14, 1972.

INTER-OFFICE CORRESPONDENCE

To: Dr. P.A. Eichorn.

From: W.L. Dunn.

Subject: 1600 objectives for 1973.

Objective I: To provide leads for new cigarette design and development.

A number of studies are planned or in progress which fall under this objective. Each study is concerned with some discrete aspect of the cigarette or smoke product idea that demands data for its evaluation. A brief description of each follows:

Nicotine/tar ratio

The nicotine/tar ratio of all cigarettes of natural leaf is $.07 \pm .01$. We have no acceptability data for nicotine/tar ratios outside this range. Since the trend in tar delivery is downward, and since nicotine is presumed to be that which is sought by the smoke does a cigarette with a high nicotine/tar ratio have market potential. Three studies of this question were executed in 1972. The critical study

is yet to be accomplished; namely, the evaluation of that matrix of nine cigarettes representing all combinations of three nicotine levels (.3, .8 and 1.2 mg) and three tar levels, (8, 12 and 16 mg). This study will be done in 1973.

Nicotine and menthol level variations in menthol cigarettes

What is the optimum combination of nicotine and menthol levels? In a manner similar to that used in the nicotine/tar ratio series, we will obtain smoker preference response to a matrix of cigarettes varying in menthol and nicotine levels, using black menthol smokers as principal panelists.

Optimum mode of tar reduction

Given that the market demands a 14 mg cigarette, and given a variety of ways to reduce delivery to this level, which way provides the most acceptable cigarette? This study has been in the making for a year. The problem is to obtain cigarettes at target delivery representing each of the reduction modes. Once the cigarettes can be provided, we will execute the study.

The influence of RTD on acceptability

In recent studies of the nicotine/tar ratio we have observed an effect on preference attributable to differences in RTD, RTD being a variable which we were unable to adequately control. We plan to conduct a preference study with cigarettes representing systematic manipulation of RTD. The study is contingent upon obtaining the required cigarettes, there being technical problems involved in attempting to vary RTD independently of other factors.

Puffing patterns as a function of cigarette characteristics

To what extent do cigarette parameters (tar, nicotine, RTD, rod length, etc.) influence puffing patterns? This is a problem that has long interested development. Several years have been devoted to the development of a device for recording puffing patterns. The device is now available (though falling considerably short of the original specifications) and observations of puffing patterns are now in progress. We expect to report some findings in 1973.

SEX-III

This study has been executed. The report is scheduled for early 1973. It is a replication of SEX-I (1968) using 1200 of the original 2500 subjects of SEX-I. We will relate changes in mean daily intake to a number of variables, with particular interest in the influence of changes in available tar upon intake.

Objective II: To further our understanding of the motives and incentives in cigarette smoking

That there are many rewards in cigarette smoking is a basic premise in our research aimed at explaining cigarette smoking. But some rewards we believe to be more crucial than others. Our program is aimed at identifying the crucial or primary reward(s), i.e. the reward(s) which, if eliminated, would lead to the discontinuation of smoking.

A second basic premise is that some people find smoking more rewarding than others because of certain yet to be isolated physiological or psychological characteristics. A third premise is that these characteristics are of such a nature as to make smoking rewarding under not all situations but only those which induce deviation in the individual's psychological state. Thus, smoking is rewarding for certain people under certain circumstances. Our tasks, then, is to identify the significant characteristic of the smoker and the significant elements of the situation and to state how the critical variables of the

person and the situation interact to reinforce the smoking act. The following are discrete projects which share this common objective.

Telemetered heart rate

A psychological characteristic which is of interest to us is "arousal level" referring to a hypothetical state of activity in the central nervous system. Heart rate is taken to be an index of arousal level. We will sample heart rate via telemetered radio signal over the course of a working day under smoking and abstention conditions. Instrumentation limitations and the difficulty of obtaining subjects that are willing to abstain on demand over several weeks time compel us to focus on a few subjects and extensive observations per subject.

We are hypothesizing from a theoretical model that variability in heart rate will be lower under smoking than under abstention conditions.

Personality and puffing behavior

In this research we observe the differences in puffing behavior under relatively nonstressed situations (subjects evaluate the difficulty of choosing between two stimuli and later actually make the choices) of people with different personality characteristics. We then attempt to predict their puffing behavior from knowledge of their personality types.

Evidence to date suggests that students with a high type V score, determined by a composite 11 of the 20 factors measured by the 16 PF, take many more puffs on cigarettes than do students with a low type V score. Students with intermediate scores take an intermediate number of puffs.

Plans for the year: (1) Extend our observations to other puff variables by using the smoking recorder. (These observations can be embedded in other data-gathering tasks, such as those of the project examining effects of product differences on smoking behavior.) (2) Improve our prediction accuracy by increasing the number and type of personality test items in our tests. (We'll give both the A and B forms of the 16 PF, add items from the Maudsley scale, and administer a portion of an intelligence test.) (3) Seek out specific personality combinations which affect the new dependent variables. (d) Extend our interest to the prediction of FTC tar taken into the mouth by our local and national panelists by relating their daily intake and average intake per cigarette to their personality.

Anxiety and puffing behavior

In this project we will repeat an investigation conducted earlier which suggests that subjects threatened by shock will show differential heart rate increases associated with the threat on days when they are allowed to smoke than on days when they are not allowed to smoke. Our observations require confirmation before we are ready to publish the results.

Personality and social class

Our measure of social class is that of the U.S. Census, which has rated various occupations along a 99 point scale. We will select a set of sample panelists from different levels of the socioeconomic spectrum and compare their cigarette consumption with their social class and personality type. In addition to the general level of class, a factor we postulate as important in determining consumption is the relative consistency of a man's educational background, salary, and his occupation. We reason that where these factors are not appropriately consistent—so that the man may be under or overtrained for his occupation, or may be under or overpaid for his occupation we might expect him to be operating under such stresses as would (a) affect

his personality test scores and (b) increase the likelihood of him becoming a smoker.

Effects of product differences on smoking behavior

This project is an offshoot of the theoretical research into states and traits which uncover differences in smoking behavior associated with differences in people. It examines differences in smoking behavior associated with differences in smoking material.

Procedures: Smoking behavior is monitored while smokers engage in a simple psychological task repeated over a series of days, during which they smoke two samples of each of eight products: two little cigars (Winchester, and Antonio and Cleopatra) and 6 85mm cigarettes (Marlboro, Winston, Multifilter, Kool, True, and Carlton). An additional two samples of four products are also smoked during a slightly more difficult task on the same days. Number of puffs per cigarette and interval between puffs are monitored both by an observer and by the desk model of the smoking recorder, which also records puff volume and maximum flow rate.

Expectation: The puff variables will be affected by (1) Tar and nicotine deliveries of the products and (2) General taste acceptability of the products as measured on a rating scale.

Estimated Completion: Depending on the availability of subjects during December and early January, when the University has a long vacation for the first time, data collection should end in March and a report should be published in April, 1973.

Comment: In the expectation that further projects of this character will be called for, we have devised a new task to occupy the smoker's attention. The task, which involves the comparison of artificially designed words called paralods with other words seen before, should be repeatable on many more occasions than is our present task. This should make it easier for us to make repeated observations on the same smokers and partly alleviate one of our major hangups, finding a constant supply of new smokers for our research activities.

Film-induced stress

Heart rate, respiration rate, galvanic skin response and muscle potential will be recorded for all subjects as they watch a neutral film. All subjects (nonsmokers, deprived smokers and smokers) will be deprived during the neutral film and for at least an hour preceding the film. Then two stress films will be shown. During this time only the smoking group will be permitted to smoke and the physiological measures will again be recorded. Mood scales will also be given at several points during the experiment. We will be looking for possible differences between groups in terms of physiological and/or mood changes. This will be an attempt to determine if smoking can affect the ability to handle stress.

Spare mental capacity

In this experiment nonsmokers, smokers deprived, and smokers will first be required to perform a tracking task. On the basis of their performance on the tracking task, they will be given varying amounts of other tasks to perform. The better a subject performs, the more he will be given to do. The object is to push every subject to his limit and determine whether there are any differences between groups in amount of spare mental capacity.

Sustained performance

We will analyze the data collected in two different types of sustained performance tasks. The first task was extremely difficult and required the subject to use a great deal of his mental capacity. The second was a

slower (one quarter the speed) version of the first and was designed to bore the subjects. We will look for differential effects of smoking condition (nonsmoker, smoker deprived, and smoker) and task difficulty on performance and on two different mood scales.

Driving efficiency and smoking

This effort is in its germinal stage. We are thinking about the feasibility of a heavy commitment of time and money to an extensive monitoring of the automobile driver aimed at determining whether smoking does affect performance. Our plans to date go only so far as to include a literature search and a possible proposed writup.

Objective III: To Provide Economic Analyses and Forecasts to R&D and New York Management, as follows:

Keep management apprised of the trends in tar and nicotine deliveries of cigarettes on the American market by continuing to provide periodic reports and analyses of weighted average tar and nicotine deliveries.

Provide economic forecast and analysis of the effect of demographic and social trends as guidance to the corporation through the annual contribution to the P.M. USA Five-Year Plan, and in answer to specific questions posed by R&O and New York Marketing and Financial Management regarding foreign and domestic economic, social and demographic trends.

Provide, through the medium of the data bank developed in successive pollings of the POL National Roster, information to R&O and to New York Marketing Management on the demographic and socio-economic characteristics of users of products of interest to Philip Morris; brand and flavor preferences and extent of usage as related to demographic and socio-economic characteristics; and changes over time in brand and flavor preferences and extent of use of cohorts of our panelists.

Objective IV: To Maintain and Where Necessary Upgrade our Capability for Providing Consumer Product Testing Services

Toward this end we plan to do the following:

Establish a local panel of black menthol smokers

Via advertisement in the local newspaper, Afro-American, we are recruiting a mail-out, phone-back panel of black menthol smokers.

Establish a national roster of black smokers

We will select appropriate city areas from city directories and draw names for mail invitations to join the POL panel. We will target for an urban sample of a thousand smokers; which should include 300 menthol smokers.

Annual (semi-annual?) dinner for R&O booth panelists with high attendance records

We plan to institute this program to encourage more regular participation. An annual dinner for the Descriptive Panel has proven most effective.

A bastard descriptive panel/booth test procedure

We are in the process of evaluating an alternative procedure for in-house product testing suggested by the Stanford Research Institute. It combines certain of the Descriptive Panel principles with those of booth testing.

PHILIP MORRIS U.S.A.—RESEARCH AND DEVELOPMENT

FIVE YEAR PLAN—1974-78

May, 1973

Overall objective

To support the growth goals of PM-USA, R&D management will strive to maintain the rate of balanced technical progress consistent with our industry leadership position. Substantial effort will be channeled into major product and process programs in

selected areas of greatest opportunity, while building the level of technical support and biological investigation needed to protect established domestic and international product positions.

I. New product and product improvement programs

R&D management strategy in the area of new products and product improvement will be to seek to anticipate the changes in cigarette design, construction or composition which will constitute readily-perceivable advances over present market brands, and to develop the technology needed to accomplish those changes.

A. Filters and filtration

The major filter effort is being directed toward understanding fundamental filtration mechanisms and providing a solid foundation of filter technology upon which to base future products. The program includes selective filtration of various smoke components, sorption and flow studies, controlled release of flavors, and analysis of the functioning of diverse filter material candidates.

Filter process development activities include plug combining through extrusion, space-fill techniques, and the single flush-filter.

New filter products under current development include foamed plastic filters, impaction filters, fused CA, spiral filter, and porous polymeric filters.

B. Smoke composition and control

This long-range program is aimed at developing economical proprietary techniques for control of those specific smoke components which may come to be regarded as undesirable. Achievement of the objection will necessitate identification of the rod precursors of smoke constituents, understanding the conditions under which the constituents are formed, and developing techniques to alter the precursors and/or reaction conditions beneficially.

C. Non-tobacco fillers and additives

The principal elements of this program are the designed filler project and its supporting studies, evaluation of competitive non-tobacco sheet materials, tobacco protein concentrates, and the synthesis of analogs of tobacco alkaloids.

D. Flavor and subjective response

Our long range effort is aimed at a dramatic reduction in both nicotine and tar while maintaining subjective responses equal to our present major brands. This complex task will require (1) understanding more thoroughly the constituents of smoke, (2) discovering which constituents contribute positively to the smoker's response, and which detract or make no contribution, (3) determining those precursor substances in the filler and paper and those pyrolysis conditions which produce each type of constituent, and (4) developing means of decreasing the proportion of undesirable constituents, increasing the desirable ones, or supplementing them with additives.

E. Other new product concepts

Other new product models under current development include a slim cigarette formulated for a strong masculine appeal, a low delivery slim, and a paper-free, film-wrapped cigarette rod.

II. Physiological and biological aspects of smoking

R&D management will continue to emphasize three areas of investigation which are relatively long-term with respect to commercial applications: (A) Smoker Motives and Behavior, (B) Bioassay Methods, and (C) Physiological Effects of Smoking.

A. Smoker motives and behavior

This program comprises a number of studies expected to provide insight leading to new cigarette designs. These include studies of optimum nicotine/tar ratios, nicotine/menthol relationships, puffing patterns as a function of cigarette characteristics, influence of RTD on acceptability, personality and anxiety factors affecting puffing behavior, and effects of product differences on smoking behavior.

B. Bioassay methods

In order to remain abreast of, and when possible anticipate, trends and findings in smoking and health, R&D will continue to develop and apply rapid bioassay methods to evaluate the effects of cigarette smoke and its constituents upon biological systems.

C. Physiological effects of Smoking

An increased level of effort is anticipated, both domestically and abroad, on the physiological effects of our smoking products. R&D management recognizes the importance to the Corporation of a rapid, informed response to challenges in the health field, and will seek to establish a level of preparedness commensurate with an industry leadership position.

OCTOBER 29, 1973.

Those listed.
T.S. Osden.
5-Year plan.

Attached is a copy of the R&D Strategy 5-Year Plan. I would be pleased if you would use this as a framework in which your various programs and projects are supportive of this document. In the near future you will be given your Project Authorization sheets, and I would be pleased to receive your plans within the next two weeks. Should you wish to discuss this with me in some detail, please let me know.

If in your opinion, there have been any omissions or mistakes within the broad R&D outline, please let me know so that we can amend.

Dr. W.L. Dunn
Dr. D.A. Lowitz
Dr. F. Will

R&D STRATEGY OUTLINE

I. SUPPORT OF ESTABLISHED BRANDS

A. General strategy

R&D management believes that the technical support of our established successful cigarette brands is the foundation upon which any future growth through new brands must be built. Therefore, established product and profit positions will be protected through a balanced program in the areas of cost savings, smoking and health, brand improvement, and service to other departments.

B. Cost savings

Primary emphasis will be on development of the leaf, stem and sheet processing technology needed to achieve the lowest possible materials cost for PM-USA without jeopardizing the reputation for consistently high quality which our cigarettes enjoy.

Secondarily, R&D will be alert to possible economies in other phases of cigarette manufacturing.

C. Smoking and health

R&D will seek to establish a level of knowledge and preparedness which will facilitate a rapid, informed response to challenges in the health field. This level will be developed largely through the sponsorship of selected studies at independent laboratories and universities. The principal in-house effort will be the development and application of rapid bioassay methods to evaluate the effects of cigarette smoke and its constituents upon biological systems.

D. Improvement or established brands

To the extent that opportunities or needs for technical improvement of established PM market brands may occasionally become evident, whether through new technology developed by R&D or by suppliers, through continuing R&D liaison with Marketing or Manufacturing, or through competitor actions, R&D will provide the technical support as needed to accomplish the improvements.

E. Technical service to other departments

Services to other PM departments will be mainly confined to complying with special project requests and continuing to provide established routine services such as the CI report, analytical support for HTI tests, etc. An important exception, however, will be service to the International Division, for whom R&D aggressively will seek to make available its technology and resources to support the continued rapid growth of that Division.

II. NEW PRODUCTS

A. General Strategy

R&D management believes that, because of the broadcast, advertising ban and other changes in the structure of the cigarette market, new brands based on relatively modest product differences can no longer be introduced successfully. The few successful new brands in the foreseeable future mainly will be those which embody major, readily-perceivable advances over existing market brands.

Recognizing that the most innovative and promising cigarette concepts for the long run will require a depth of understanding of our product and customer which we have not yet attained and which can only be achieved through substantial investments in directed research, R&D management will concentrate a large part of the resources at its disposal in two major long-range new product programs: a cigarette with controlled-composition mainstream smoke, and a "full-flavor" cigarette delivering less than ten milligrams of FTC tar.

B. Composition control of mainstream smoke

This program is aimed at developing economical proprietary techniques for control of those specific smoke components which may come to be regarded as undesirable. The program will include projects to identify the rod precursors of unwanted smoke constituents, to understand the conditions under which the constituents are formed, and to develop techniques to eliminate selectively the unwanted constituents from the smoke, either by altering the precursors and/or reaction conditions, or by removing the constituent after it is formed (principally by filtration).

C. Full-flavor/low delivery

This program is directed at a dramatic reduction in cigarette tar level while maintaining subjective responses equal to our present major brands, and is in several important ways, the complement of the program described above. As the Composition Control effort seeks to "eliminate the negative," this program is to "accentuate the positive." The task requires (1) understanding more thoroughly the constituents of smoke, (2) discovering which constituents contribute positively to the smoker's response, and which detract or make no contribution, (3) determining those precursor substances in the filler and paper and those pyrolysis conditions which produce each type of constituent, and (4) developing means of increasing the relative concentration of desirable constituents.

D. Other new product technology

R&D management recognizes that, despite the importance of the two new product programs described above, these alone will not

provide sufficient breadth of technology to enable the Company to become the undisputed industry leader by 1980.

[1.] Accordingly, additional programs will be maintained with two broad objectives:

[2.] To develop cigaret features and processes which can find *application* in a possible new brand, although the features and processes may not be sufficient justification by themselves for a new brand or brand extension.

To improve our understanding of how and why smokers actually smoke cigarets, to provide leads for other major new product concepts.

Strategically, R&D management wishes to maintain a large number of projects of these two types, sufficiently diverse to cover all of the important elements of the product and its use. Although the projects in the aggregate will represent a major investment of R&D resources, the expenditure level on any single project will be relatively low.

Charge number: 1600.

Program title: Smoker Psychology.

Project leader: W.L. Dunn, Jr.

Period covered: April 1-30, 1974.

Date of report: May 9, 1974.

Project title: Aloha Brain Waves and Smoking.

Written by: W.L. Dunn.

Nearing completion of data collection.

Project title: Controlling Smoke Inhalation Post-Puff.

Written by: W.L. Dunn.

Still in instrumentation phase.

Project title: Puffing Behavior.

Written by: F.J. Ryan.

When 16 students smoked 85 mm Marlboros or Salems cut to different lengths, we observed that (1) first puffs were strikingly similar in volume, flow, and duration, whether taken on an 85, 78, 71, 65, or 59 mm rod; (2) second puffs were strikingly similar, too, whether at 78, 71, 65, 59, or 52 mm; (3) later-than-second puffs had volumes which were determined by rod length, rather than puff number. In this study puffs were taken at 60-second intervals. But smokers are normally free to take puffs at any time, so that it is inappropriate to use puff number alone to categorize volumes. A third puff taken when an 85 mm rod is 71 mm long will have a different volume than a third puff taken when a rod is 40 mm long. Interpuff interval and static burn rate must be taken into account.

Some summarizing and grouping of the data in several recent studies suggests that puff volume is dependent on the weight of the smoker. Our nine heaviest student smokers had considerably larger volumes per puff than our nine lighter smokers. Most of the volume increase is attributable to differences in flow rate, but there are differences in puff duration, too. Whether this is due to general strength and vigor, to generally greater appetite, to lung capacity, or to some other factor is unknown. If we take smoke volume per puff, body weight, and puff by puff tar and nicotine deliveries into account, finding mg tar (or nicotine) per puff per kg of body weight—then the group differences disappear.

This suggests some type of dose hypothesis in controlling smoke volume intake.

Project title: Smoking, Arousal, and Mood Change.

Written by: T.R. Schori.

Data collection continues. We had hoped to be able to obtain good heart rate data using a cassette-type recording system. That now seems unlikely based upon the many difficulties we have experienced with that system. However, these data are only a nonessential minor part of this study.

Project title: Miscellaneous.

Written by: T.R. Schori.

SEF is nearly ready to go out with an RP³ test of our DL-2 cigarettes. One of the menthol cigarettes for MN-3 is being remade.

Project title: Regression Analysis.

Written by: T.R. Schori.

Having done a number of studies (JND-1, JND-2, TNT-3, TNT-4) in which we have systematically manipulated tar and nicotine parameters of cigarettes, we are trying to see if we can make any overall conclusion. Specifically, we are trying to predict nicotine/tar ratios for optimal cigarette acceptability at differing tar deliveries.

PHILIP MORRIS U.S.A.,

RESEARCH CENTER,

October 1995.

Report Title: Low Delivery Cigarettes and Increased Nicotine/Tar Ratios, A Replication.

Written by: Barbara Jones, Willie Houck, Peggy Martin.

Approved by: William L. Dunn, Jr. and Leo F. Meyer.

Distribution: H. Wakeham, F. Resnik, T. Osdene, R. Thomson, W. Gannon, R. Fagan, F. Daylor, J. Osmalov, H. Daniel, W. Clafin, P. Gauvin, M. Johnston, F. Ryan, C. Levy, F. Reynolds, Indexer Day File (2), Central File (2).

ABSTRACT

This study provides evidence that the optimum nicotine to tar (N/T) ratio for a 10 mg tar cigarette is somewhat higher than that occurring in smoke from the natural state of tobacco, namely, .07±.01.

Three low delivery cigarettes (10 mg tar) differing in terms of N/T ratio (.06, .09 and .12) were rated in terms of subjective strength and acceptability by 235 regular filter smokers. Two packs of each were provided each respondent plus two packs of a control Marlboro.

The .09 N/T ratio experimental cigarette was equal in acceptability to the Marlboro control. The .06 and .12 N/T ratio cigarettes were both judged less acceptable.

All four cigarettes were judged to be different from one another in terms of strength in the following ascending order: .06, .09, control, .12.

One can infer from these results that nicotine does contribute to the perceived strength of cigarette smoke, and that the optimum N/T ratio for a 10 mg tar cigarette is somewhat higher than that occurring in smoke from the natural state of tobacco, namely, .07±.01.

We plan to use these findings as guidelines in conducting another N/T ratio study using the National POL panel.

INTRODUCTION

It appears that aims of research in the area of low delivery cigarettes need to be twofold. One goal is to come up with a low delivery cigarette that will appeal to current low delivery cigarette smokers. It seems logical that such a cigarette can look like a low delivery cigarette, i.e., possibly having unconventional tipping paper and an unusual appearing filter. It may even be suggested that a cigarette will be acceptable to many current low delivery smokers only if it has the taste characteristics that they associate with a "healthy cigarette" e.g. low in flavor, strength and impact. One study (Schori, 1972) indicated that a large national sample of smokers did not perceive any cigarette then on the market as being low in delivery and high in flavor.

Another objective, providing the impetus behind the present study, is the development of a low delivery cigarette that will both look and taste like a regular filter cigarette and thus will appeal to current regular filter smokers. The idea behind this is that some of these smokers would possibly smoke a low

delivery cigarette but they consider the low delivery cigarettes currently on the market as too flavorless, too weak and too low in impact. If a low delivery cigarette with impact and flavor were developed, it may cause the segment of current regular filter smokers who are concerned about their health but demand a flavorful cigarette to voluntarily switch to the low delivery cigarettes. This may seem at first to be a senseless venture since it might result in Marlboro smokers switching to this low delivery cigarette. However, we must recognize the possibility that if we do not develop such a cigarette, it may be developed by another tobacco company. Having developed such a cigarette would also give us an advantage in the event that the government imposes delivery restrictions. Furthermore, some portion of current low delivery smokers may desire to switch to a more flavorful cigarette and others may follow as consumer experience results in changing the image of low delivery cigarettes so that smokers believe a flavorful cigarette can really be "healthy."

It was hypothesized in an earlier study that increasing nicotine to tar (N/T) ratios¹ from the 107 ratio of most cigarettes currently on the market might increase the subjective strength of low delivery cigarettes and thus their acceptability among regular filter smokers. Therefore, three low delivery cigarettes in the 10 mg tar range with varying N/T ratios were compared to a Marlboro control. (Schori & Martin, 1974b) The results of that study (DL-1) indicated that the 10.7 mg tar, .12 nicotine to tar (N/T) ratio cigarette was comparable to the Marlboro in terms of both subjective acceptability and strength. Although cigarettes in this tar delivery range had previously achieved parity with Marlboro in acceptability (Schori & Martin, 1974a), the DL-1 study was the first time that such a cigarette achieved parity in both acceptability and strength.

However, on the DL-1 study the variations in N/T ratios of the low delivery cigarettes were confronted with variations in tar delivery. Therefore, the present study was designed as a follow-up of the DL-1 study. Three experimental low delivery cigarettes targeted to delivery 10 mg tar with N/T ratios of .07, .10 and .13 were compared to a Marlboro control in terms of subjective acceptability and strength. It was desired that the experimental cigarettes be more similar in tar delivery than was the case in the DL-1 study.

METHODS

Cigarettes

The experimental cigarettes were targeted to deliver 10 mg tar with .07, 10 and .13 N/T ratios. To obtain the two highest ratios, it was necessary to add supplementary nicotine in the form of nicotine citrate. The delivery levels obtained for the three experimental cigarettes and a Marlboro control are shown below (for complete analytic data, see Appendix A):

	Control			
Tar (mg/cigt.)	10.4	11.0	11.0	18.0
Nicotine (mg/cigt.)	0.68	0.95	1.31	1.03
Tar (mg/puff)	1.09	1.13	1.08	2.04
Nicotine (mg/puff)	.07	.10	.13	.12
Nicotine/Tar Ratio	.06	.09	.12	.06

Inspection of the above table shows the success in maintaining constant tar over the

¹Since tar was virtually constant across the three experimental cigarettes, it would have sufficed in this study to refer to nicotine rather than to N/T ratios. However, the use of N/T ratios was intended to facilitate discovering possible trends over different levels of tar. Furthermore, this terminology makes it more readily apparent as to how the data relate to the .07 N/T ratio that is characteristic of most cigarettes currently on the market.

experimental cigarettes, particularly with regard to tar/puff.

Test procedures

The test was sent to 300 RP³ 85 mm regular filter smokers, half of whom were Marlboro smokers. The panelists received 10 packs of cigarettes; 2 packs of each of the four coded cigarettes (the 3 experimental cigarettes and the Marlboro control) and 2 packs of uncoded Marlboros to complete the carton. They were instructed to smoke the cigarettes in any order they wished as long as they filled in the scales for one set of codes before beginning to smoke the next set. In the event that the panelists smoke the cigarettes in the order suggested by the order of the rating scales on the ballot, all possible presentations of the rating scales for the four cigarettes were used an equal number of times. The cigarettes were rated on both an acceptability scale and a strength scale. (1=dislike extremely to 9=like extremely; 1=extremely weak to 9=extremely strong) The ballot is shown in Appendix B.

Data analysis

The ratings from the acceptability and strength scales were analyzed by means of a one-way analysis of variance with repeated measures on subjects. Individual comparisons of means, using Duncan's Range Test, were performed in order to assess the significance of differences between pairs of cigarettes where overall significant differences were detected.

RESULTS

The return rate

The return rate was 78%.

Analyses of variance

The analyses of variance for the acceptability and strength scale ratings of the total panel are summarized below.

	Marlboro	.06 N/T	.09 N/T	.12 N/T	Probability
Acceptability (N=235):					
X	5.77	5.32	5.65	5.26	.0034
S.D.	1.88	1.89	1.91	1.95	.....
Strength (N=235):					
X	5.34	4.34	4.73	5.62	.0001
S.D.	1.28	1.67	1.46	1.50	.....

From this summary, it can be seen that significant differences ($p < .05$) were found among cigarettes in both acceptability and strength. A multiple range test (Duncan, 1955) was performed to make individual comparisons between mean ratings. The results of this analysis are given below with the mean ratings rearranged in ascending order of magnitude. Those means not underlined by a common line are significantly different from one another ($p < .05$).

	.12 N/T	.06 N/T	.09 N/T	Marlboro
Acceptability	5.26	5.32	5.65	5.77
Strength	4.34	4.73	5.34	5.62

From these analyses it can be seen that the experimental cigarette with the .09 N/T ratio and the Marlboro control were equally acceptable and were more acceptable than the other two experimental cigarettes. These other two experimental cigarettes (.06 and .12 N/T ratio) also were not significantly different from one another in acceptability.

Further inspection of the individual comparisons reveals that the three experimental cigarettes and the Marlboro control were all significantly different from one another in strength.

DISCUSSION

In this study, three low delivery cigarettes in the 10 mg tar range varying in nicotine N/

T ratio (.06, .09 and .12) were compared to a Marlboro control in terms of subjective acceptability and strength. The .09 N/T ratio cigarette was found to be equal in acceptability to the Marlboro control. The highest N/T ratio cigarette (.12) and the proportional reduction of tar and nicotine cigarette (.06) were less acceptable than the control. Among the experimental cigarettes, strength ratings went up as N/T ratio increased; and interestingly, the 11 mg tar cigarette with .12 N/T ratio was rated significantly higher in strength than the 18 mg tar Marlboro control.

These data suggest that acceptability increases as N/T ratio increases up to a certain ratio and then decreases. Thus it seems that increasing the strength of low delivery cigarettes by adding nicotine citrate increases the acceptability up to a point where the cigarettes may be perceived as too strong and acceptability decreases. Since the two highest N/T ratio experimental cigarettes were made by adding nicotine in the form of nicotine citrate spray, there is a possibility that the increased citrate that accompanied the increased nicotine is crucial in the resulting increases in subjective strength.

The results of the DL-1 study showed overall trends that were very similar to those of the present study. For the experimental cigarettes, strength ratings increased as the N/T ratio increased. However, whereas the present study found the .12 N/T ratio cigarette to be a stronger than the Marlboro control, the results of the DL-1 study indicated that these cigarettes were considered equal in strength.

In regard to acceptability, the DL-1 study results concurred with the results of the present study in that the experimental cigarette with the moderate level of nicotine addition was rated higher in acceptability than the proportional reduction cigarette and equal to the Marlboro control. Since the .12 N/T ratio cigarette in DL-1 was not seen as stronger than the control, it seems logical that the acceptability ratings would not decline. In fact, in the DL-1 study, both of the cigarettes with added nicotine were as acceptable as the Marlboro.

The difference between the two .12 N/T ratio cigarettes in the two studies that caused them to be perceived differently in relation to the control is not obvious. The analytical data for the cigarettes in the DL-1 study are shown in Appendix C.

Inspection of the analytical data for the two tests reveals that while total alkaloids decreased from DL-1 to the present study for all other cigarettes, they increased in the .12 N/T ratio cigarette. Another possible explanation is that there were subtle taste differences between the .12 N/T ratio cigarettes in the two studies that are not reflected in the analytical data but are responsible for the difference in strength and acceptability ratings. Unfortunately, no data on taste differences are available.

In conclusion, the results of this study support the DL-1 findings that increasing N/T ratios from the .07 level increases the subjective strength of low delivery cigarettes. Additionally, there is an indication that these increases in strength will be accompanied by increased acceptability. However, the data suggest that caution should be exercised such that N/T ratios are not increased to the extent that the increases in acceptability associated with moderate increases in N/T ratio are lost.

Further research

In order to clarify the meaning of the results of this study, it would be beneficial to discover whether nicotine has the same effect if added in forms other than nicotine citrate. Perhaps nicotine and citrate inter-

act such that increases in both nicotine and citrate are necessary for any differences in subjective strength.

Since RP³ is a local panel and there is a possibility of regional differences in cigarette preferences, we propose to conduct another study using the National POL panel. In this study we will test two 10 mg tar cigarettes, with N/T ratios of .07 and .11, with a Marlboro control. The .11 N/T ratio was chosen in an attempt to make a cigarette that will be perceived as stronger than the .09 N/T ratio cigarette in the present study but not as strong as the .12 N/T ratio cigarette. In other words, we are using the guidelines suggested by this study to attempt to make a 10 mg tar cigarette that will equal a Marlboro control in both subjective acceptability and strength.

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APPENDIX A.—ANALYTICAL DATA

	Control Marlboro 85	Experimental cigarettes		
	D4BDJ- 1	D48DK- 1	D4BDL- 1	D48DM- 1
Target—Tar, mg/cigt.		10	10	10
Target—Nicotine, mg/cigt.		0.7	1.0	1.3
Smoke:				
Butt Length, mm	28	28	28	28
FTC Tar, mg/cigt.	18.0	10.4	11.0	11.0
Nicotine, mg/cigt.	1.03	0.68	0.95	1.31
Puffs/cigt.	8.8	9.5	9.7	10.2
Filtration Eff., %	45	60	57	58
Nicotine/Tar Ratio .....	.0572	.0653	.0863	.1190
Tar, mg/Puff	2.04	1.09	1.13	1.08
Nicotine, mg/Puff .....	.12	.07	.10	.13
Cigarette:				
Total RTD, in. of H ₂ O	4.3	5.4	4.6	4.6
Static Burn. Time, min.	7.7	7.5	7.4	7.8
Length, mm	84.5	84.3	84.2	84.3
Circumference, mm	25.0	25.1	25.1	25.0
Paper:				
Additive, type	Cit.	Cit.	Cit.	Cit.
Porosity, sec.	20	17	19	17
Filter:				
RTD, in. of H ₂ O	2.6	4.0	3.6	3.6
Length, mm	20.8	21.0	20.9	21.0
Weight, g	0.15	0.20	0.19	0.17
Tipping Paper Length, mm ..	25	25	25	25
Dilution, %	None	19	25	26
Filler:				
Total Alkaloids, %	1.47	1.49	1.80	2.97
Total Reducing Sugars, % ..	6.1	6.9	6.8	7.8
Wt. of Tob., g	0.757	0.788	0.781	0.790
Rod Density, g/cc	0.239	0.248	0.246	0.251
Targeted Nicotine				
Citrate Spray, %	—	—	3	8

NOTES ON PROGRAM REVIEW PRESENTATION 2/79

Last year I devoted most of my time to the rationale and conceptualization of our program, and had little time left to talk about what we were in fact doing. Today I'd like to be more concert and talk about the research projects we have underway and planned, with comments to relate the projects to our program objectives and to the R&D Five-Year Plan.

First let me state our 3 objectives:

1. To understand the psychological reward the smoker gets from smoking.
2. To understand the psychophysiology underlying this reward.
3. To relate this reward to the constituents in smoke.

Our three lines of investigation:

1. The effects of nicotine and nicotine-like compounds upon animal behavior.
2. The effects of smoke and smoke constituents upon the electrical activity in the human brain.

3. The effects of changes in smoke composition upon puffing behavior, inhalation behavior and descriptive statements by the smoker.

Our people:

Let's first talk about Gullotta's work.

He joined us a year and a half ago. The better part of the first year was used up in getting the EEG lab on line.

To date he has complete data collection on the first and very crucial study of the effect of smoking on the visual evoked response. At the moment he is working closely with the computer group in analyzing that data.

What is the VER?

Why the VER?

Dr. Gullotta has another study underway. This is a long-term project because of the problem of recruiting subjects. He is attempting to catch R&D smokers who have decided to quit before they do so. He records the EEG before they quit, then repeats the recording at fixed intervals following quitting. Subjects are scarce—so the study can take some time. He has picked up 45 to date.

Hopefully, he will be able to garner some knowledge on an old problem:

Changes that occur quitting have been cited by Jarvik Russell as withdrawal effects. There have been no long-term studies of abstinence, so we don't know whether the observed changes upon quitting are indeed withdrawal effects of an enduring return to baseline. Frank's observations might be of great help at least insofar as CNS mediated changes are concerned.

Frank has other studies scheduled to being as the VER is completed. If he finds from VER study that he can identify discrete smoke induced event (i.e. a change in the after-discharge component for example) he will proceed directly to a comparison of those modes of nicotine administration, inhalation and ingestion and iv injection. At the same time that he is maintaining the EEG, he will monitor nicotine blood level, heart rate and perhaps other peripheral or autonomic signals.

Obviously, he will need medical collaboration. The Medical Dept. has agreed to work with him.

Russell has pointed to a possibility that we had also come to consider seriously about the smoker's smoking behavior. In all the titration theorizing, it has been postulated that the smoker is seeking to maintain a supply of nicotine at some optimum level in the bloodstream, and we have lamented the obstacles to getting good tracking of the level of nicotine in the blood. As new knowledge has developed, two observations have emerged which influence our thinking:

1. Observed smoking patterns are not consistent with the premise of titration for a constant blood level and

2. The most probable locus of action is within the central nervous system.

We are quite ignorant of smoke-derived nicotine's course through the brain:

a. the conditions required for its passage across the blood brain barrier (blood concentration, barrier permeability, etc.)

b. threshold concentrations required at brain loci for

c. diffusion rates, selective localization

d. rate of metabolism

I think I'd best add here a little conceptualizing. Until recently we have entertained a titration hypothesis—we have postulated that the habituated smoker is seeking to maintain some optional level of nicotine in his bloodstream. As a corollary we would expect to see the smoker attune intake to blood level. Given a more diluted smoke, he would smoke more, with more cigarettes or bigger puffs, or deeper inhalations.

With our attention increasingly drawn to CNS effects of smoking, we are sorely frus-

trated by the constraints imposed upon us in studying the human smoker. With the effects upon manifest behavior continuing to elude us, we are limited to the EEG.

But happily there are other organisms than human that have CNS's which respond to nicotine. Which brings me to the comparative psychophysiological programs of Carolyn Levy and Gary Berntson. There is considerably greater license allowed in obtruding upon the corpus integrum of the species white rat than the species *Homo Sapien*. With apologies both to Gary and Carolyn, I shall pointedly avoid associating study with investigator.

We are systematically assembling a battery of behavioral tests which can be used in the larger assay program of R&O. Because of the sophisticated level at which the chemistry of nicotine is being investigated, it has become imperative that assay tools be made available to our chemists to assist them in assessing the nicotine likeness of nicotine in its various forms; its analogues, and other related compounds. Since our vital interest in nicotine rests upon its presumed psychophysiological actions, then those behavioral changes that reflect these actions possess intrinsic assay significance. Thus the nicotine likeness of a compound can be expressed in terms of the degree to which it can induce those changes induced by nicotine.

To date we have evaluated two behavioral tests for nicotine-likeness. One has been incorporated into the assay program. The other is still under investigation.

The stimulus discrimination technique has been described to you already. The animal is trained to press lever A when injected with nicotine, and lever B when injected with saline. After being trained to a predetermined level of correct hits, the animal is injected with Compound X. The ratio of Lever A to Lever B presses can be construed as an index of nicotine-likeness. We make no pretense to knowledge of the underlying mechanisms—we do submit the method as empirically valid.

The second technique still under study is the tail flick test. This is a means for determining relative changes in sensitivity to thermal pain induced by impinging focused radiant heat upon the animal's tail. The time from stimulus onset to the tail flick that stops the stimulus is called tail flick latency. We have established that the latency is increased by injected nicotine. Of course, one would expect other compounds to increase latency, as the test is not one of high specificity, but as part of an assay battery it has some merit.

The nicotine-induced analgesia as reflected in the tail flick latency increases is specific to thermal pain and perhaps some other sources of pain, but does not generalize to all sources. Dr. Berntson is developing a theoretical model based upon these observations and undertaking further research to test the model. He will be telling us about these developments in due time.

Three other behavioral manifestations of the CNS effects of nicotine are being or about to be evaluated for inclusion in the behavioral assay battery.

1. Motor activity

2. Prostration syndrome

3. Nicotine self-administration

Yet another assay candidate is the rat EEG.

This whole program of assay exploration is a two-edged sword for us. There is basic research implicit in the evaluation of each test, in fact, in the very selection of those behaviors which we are monitoring for nicotine effects. I might also point out that some of these tests have potential for establishing dose-response curves. We have already used

one for just this purpose. We are forever mindful of the implications of the observed effects of nicotine for clues as to the reinforcing mechanism underlying human smoking.

The ultimate in this program is an inventory of all the behavioral and quasi-behavioral effects of nicotine at the animal level and a test for each such effect reduced to a parsimonious routine.

We can even at this early stage anticipate an extensive list of nicotinic behavioral effects and a test routine for each. The assay battery could rapidly become too cumbersome from the sheer number of discrete tests available. We are going to need a set of criteria for selecting those tests to be retained for routine assay.

One obvious criterion is nicotine specificity—nicotine brings the only compound known to elicit the effect.

Another criterion would be relevancy to human smoking which would rule out such tests as tail flick or latency—or the tail pinch test.

I would point out again that I have not indicated where these studies are being undertaken they may all be here, all at Ohio State, or some at both.

We have several studies underway and beginning that are more immediately concerned with the cigarette. Frank Ryan is carrying out the long-term project of annual monitoring of preferences, with which I will assure you are sufficiently familiar. The third run is to begin within a few weeks. We are hoping to get some clues as to whether there are trends in cigarette preferences over 4 or 5 year time span; and, if there are trends, what characterizes them.

Frank Ryan is also beginning a study of the nicotine/tar ratio at the 5 mg tar delivery level. This is a study we would have liked to have undertaken some time back, but only recently has the technology of cigarette making made it possible to get the range of nicotine delivery needed with a constant tar delivery.

As a corollary to this field study, Frank is doing a classical threshold study. What size of a nicotine increment is needed in order to be detected by the smoker? This is to be done not only at the 5 mg tar delivery level but at the 15 mg and perhaps the 10 mg level as well. We envision a family of curves with nicotine delivery differences plotted against: of persons detecting difference at three tar delivery levels. Acceptability responses will be gotten at the same time. Such information can be timely and relevant to the recurring expression of concern about the relative downness of N/T ratios in P.M. products.

Yet another product related study being conducted by Ryan is the salivation study. Low tar products are often described as "hot and dry." It is possible that the perceived dryness is attributable to a reduced salivation response, rather than same intrinsic property of the smoke? The question has been addressed before by this laboratory, but indirectly. We don't know of any systematic attempts to measure saliva flow-in response to cigarette-smoke. We judge the question to be important enough to be explored further.

Dr. Bernston has also some human work underway which I shall mention briefly since it is coordinated with our own program.

He has nearly completed data analysis on a study of the effect of smoking on automatic response to stress. He used three stress, situations; anticipation of electric shock, viewing autopsy slides and an cognitive task. He recorded almost every measurable automatic response; heart rate, muscle tension, blood flow, respiration, electrogastric events and skin potential.

He is just beginning another study of the influence of smoking on higher mental processes. We have, as have others, looked for the

effects of smoking upon human performance over the years, without ever discerning a straight forward effect. Or Bernston reasons that the effect may be a subtle one which is real but elusive. He is using a memorizing and recognition task (the Sternberg paradigm) in such a way as to be able to partial out the contributions to overall performance of (1) attention, (2) memory efficiency, (3) rate of memory formation and (4) retrieval efficiency. As a last item, we are finally moving forward on the study of nonobtrusive monitoring of smoke inhalation. Since Neil Nunnally joined us last year, he has taken over the instrumentation problem and brought us to a near on-line state.

The device is based upon the proposition that circumferential changes in the chest and the abdomen can be converted to a good estimate of inspired volume.

We have good evidence that when the circumference changes are small, volume is a linear function. The average total lung capacity of 6 liters, the average smoke inspiration is one liter.

Considering all the ways to measure, the mercury strain gauge was selected, but there were problems.

The solution was to minimize the current flow-developed circuitry that provides a 100 M amplification, and a sophisticated method of summing the two inputs to yield a signal that is almost linearly related to volume.

There is another candidate transducer (inductance changes in coils about the chest and abdomen) already incorporated into a commercially available device. On order, due to arrive by March 1.

We will be running comparative tests of these two units, select the better one and proceed to solving the remaining problems:

(a) tagging the smoke-laden inhalation.

(b) incorporating a recorder into the system.

When the entire assembly is ready, I will begin a series of studies, all designed to determine the degree to which the smoker accommodates his intake to 1) smoke composition and 2) need.

THE PENNSYLVANIA STATE
UNIVERSITY,
DEPARTMENT OF BIOBEHAVIORAL
HEALTH,

University Park, PA, July 28, 1995.

Hon. HENRY A. WAXMAN,
House of Representatives, Rayburn House Office
Building, Washington, DC.

DEAR MR. WAXMAN: I have reviewed the attached data on Benson & Hedges Filtered Cigarettes (70 mm) using standard assumptions of inferential statistics.

The average Nicotine/Tar Ratio for the 17 measurements from 1968 to 1985 (not including the 3 measurements for 1981 SP, 1981 HP, 1983 HP) is .066 (minimum=.058, maximum=.088, Standard Deviation=.00738). A score of 0.20 (as was observed in 1981) is very unlikely to come from the same population. The probability of sampling a score at least as large as 0.20 is considerably less than 1 in 100,000 ($z=18.16$). Even the ratio observed in 1983 (0.11) has a probability less than 1 in 100,000 of coming from the same population ($z=12.19$).

If one looks only at the years when this brand was in the 1 mg tar range (from 1978 to 1985), the average ratio for the 4 years (not including those years at issue) is 0.075 (minimum=.058, maximum=.088, Standard Deviation=.0126). The probability of sampling a score at least as large as 0.20 is considerably less than 1 in 100,000 ($z=10.28$). The probability of sampling a score at least as large as 0.11 is less than 4 in 1,000 of coming from the same population ($z=3.13$).

These analyses support the interpretation that the Nicotine/Tar Ratios were much

larger in 1981 and 1983 than in the other years and confirm what is readily apparent to the naked eye when looking at the attached plot of ratios.

Sincerely,

LYNN T. KOZLOWSKI, PH.D.,
PROFESSOR AND HEAD,
Department of Biobehavioral Health.

REGULAR-LENGTH (70 MM) BENSON & HEDGES FILTERED
CIGARETTES

Year	Tar	(+/-)	Nicotine	(+/-)	Ratio
10-68	21.0	(0.5)	1.29	(0.06)	0.061
2-69	20.1	(.5)	1.38	(.03)	.069
10-70	18.7	(.4)	1.35	(.03)	.072
8-71	18.4	(.3)	1.30	(.02)	.071
7-72	12.2	(1.1)	0.86	(.09)	.070
1-73	9.9	(.3)	.68	(.03)	.069
8-73	9.8	(.4)	.66	(.03)	.067
3-74	9.4	(.4)	.61	(.03)	.065
9-74	9.1	(.4)	.56	(.03)	.062
3-75	9.1	(.3)	.53	(.02)	.058
9-75	9.3	(.4)	.55	(.02)	.059
4-76	9.2	(.3)	.53	(.02)	.058
6-77	9.8	(.2)	.64	(.02)	.065
5-78	0.9	(.1)	.06	(.01)	.067
12-79	.8	(.1)	.07	(.01)	.088
3-81	.6	(.1)	.12	(.01)	.200
12-81	(.1)		.10	(.02)	.200
3-83	.9	(.2)	.10	(.01)	.111
2-84	1.3	(.2)	.09	(.01)	.069
1-85	1.2	(.1)	.07	(.01)	.058

(¹) Below the sensitivity of the method (i.e., <0.5)

The SPEAKER pro tempore. Under a previous order of the House, the gentleman from North Carolina [Mr. JONES] is recognized for 5 minutes.

[Mr. JONES addressed the House. His remarks will appear hereafter in the Extensions of Remarks.]

POLITICAL ADVOCACY REPORTING

The SPEAKER pro tempore. Under a previous order of the House, the gentleman from Colorado [Mr. SKAGGS] is recognized for 5 minutes.

Mr. SKAGGS. Mr. Speaker, I would like to return for a few minutes to this 13-page piece of legislation that is buried in the Labor, Health, and Education appropriation bill that the House will be taking up shortly. It is labeled political advocacy, and it is really an incredible effort at speech control and reporting, all at the hands of this new majority that made such a big deal out of wanting a less intrusive Government.

Well, let me just ask my colleagues to go through the painful exercise of actually reading this legislative provision in an appropriations bill. It is an absolutely chilling experience when you realize that this Rube Goldberg contraption that has been invented in order to get at the question of Federal funds being used to persuade Congress about public policy, how vast and really incredibly intrusive into civil liberties a proposal this is.

I spent some time yesterday explaining some of the people who would be covered as, quote, grantees under this legislative provision in the appropriations bill. I hope you will pay some attention to this; your constituents are absolutely going to hate this bill if it were to become law.

For instance, disaster victims getting emergency aid from FEMA would be a grantee, and I will tell you in a minute what grantees have to go

through, researchers getting NSF research grants, probably because the definitions are so broad including anything of value coming from the Federal Government, a farmer getting emergency livestock feed in a major snowstorm, irrigators receiving subsidized Bureau of Reclamation water, and it probably even includes intangibles, so a broadcaster getting an FCC license would probably be a grantee under the provisions of this proposal, as, for instance, would many organizations, maybe your local church or YMCA, YWCA, if you are running a low-income child care program. With a Federal grant you would be brought into the provisions of this incredible proposal.

Now what happens to those who are covered? Let me just take a minute to walk you through what would happen to one very typical, if hypothetical, example, namely a pregnant woman or nursing woman getting food vouchers under the Women, Infants and Children's program. Let us just consider the example:

We will call her Sally. She will be required to follow "generally accepted accounting principles in keeping books and records," about the number and the value of the assistance that she is receiving under the WIC program. She would be required to file with the Department of Agriculture by the end of each calendar year a certified report on a standard form provided by your friendly Federal Government with her name and her ID number, description of the purposes that she put her WIC grant to, a list of all the Federal, State or local government agencies involved in administering the WIC program, and here is the real hooker in this, a description of her acts of, "political advocacy," which is defined all encompassingly to include, for instance, any attempt to influence any Federal, State, or local government action, including any attempt to affect the opinions of the general public or any part of the public about any government action. This would include, for instance, Sally's coming to one of your town meetings and talking with her congressman or congresswoman, writing a letter to the editor about some issue of public policy pending in her community.

This political advocacy activity would also include "participating in any political campaign of any candidate for public office," Federal, State, or local. So, marching in a candidate's parade, for instance, would be a political advocacy activity that a WIC grantee would have to report to the Department of Agriculture.

□ 1715

It goes on and on and on. This would create, in some computer in Washington, DC, a master list of all political advocacy activities carried on by all Federal grantees around the country. Each Department would have to get these reports annually certified, subject to audit, subject to challenge,